Tradeoffs in Alfalfa Yield and Quality

by Dan Undersander, University of Wisconsin

Many growers are asking about the tradeoffs in alfalfa yield and quality as they enter quality pricing contracts for hay/haylage. Premiums are paid for quality, yet the higher price for increased quality is often offset by lower yields from fields cut earlier for higher forage quality.

Yield/quality is difficult to assess since both alfalfa growth and change in forage quality vary considerably depending on environmental conditions. Little data exists on both yield and quality change over time. The USDA-Dairy Forage Research Center is conducting a detailed study (jointly with the Universities of Pennsylvania and Idaho) to attempt to develop some answers. Data from 2004 and 2005, combined with current UW-Madison studies, can give growers a few benchmarks to help them decide if the season is proceeding 'normally' or not.

It seems reasonable to plan on the alfalfa yield increase near harvest to be about 100 lbs per acre per day if growing conditions are 'average.' This yield change is consistent across cuttings, exclusive of late fall. However, yield change per day around harvest time varies considerably and has ranged from 0 to 200 lbs per acre per day. The daily yield increase will be less in cool, cloudy weather, and if insects, disease or drought occur, and greater in periods of good moisture, sunshine and 75° to 85° weather.

For several years, alfalfa quality changes have been analyzed as having advancing maturity over time across each harvest. It appears quality of first cutting changes at the fastest rate and later cuttings change in fiber and digestibility at a slower rate. Studies have found the first cutting decreases about five points of relative feed value (RFV) per day, second cutting decreases two to three points per day and third and fourth cutting, during the growing season, decline one to two points per day. The late fall growth may change little in forage quality during mid to late September and early October. Relative forage quality (RFQ) will change about the same as RFV on first cutting and then decline about three points per day on second, third and fourth cuttings. Drought and potato leafhopper dramatically reduce yield but increase quality.

The table allows growers to calculate changes versus the payment basis for quality of forage. Remember that the change in quality is on the total forage harvested for the cutting (usually 1.5 to 2 t/a per cutting). These numbers can also be used with the hay cut date spreadsheet (available at www.uwex.edu/ces/forage) to estimate optimum return based on yield and value of quality. These data suggest targeting 135 RFQ (RFV) harvested forage when the premium per point of RFQ (RFV) per ton is $.60, targeting 150 RFQ (RFV) forage when the premium is $.80/RFQ/ton, and targeting 165 RFQ (RFV) when the premium is $1.00/RFQ/ton. Dairy quality hay is generally considered to be 150 RFV (RFQ) or higher.

Cutting	Yield (lb)	RFV	RFQ
	-------Daily Change-------		
1	100	-5	-5
2	100	-2 to -3	-4
3	100	-2	-3
4	100	-1	-3

Table 1. *Alfalfa forage change in yield and quality during the growing season.*